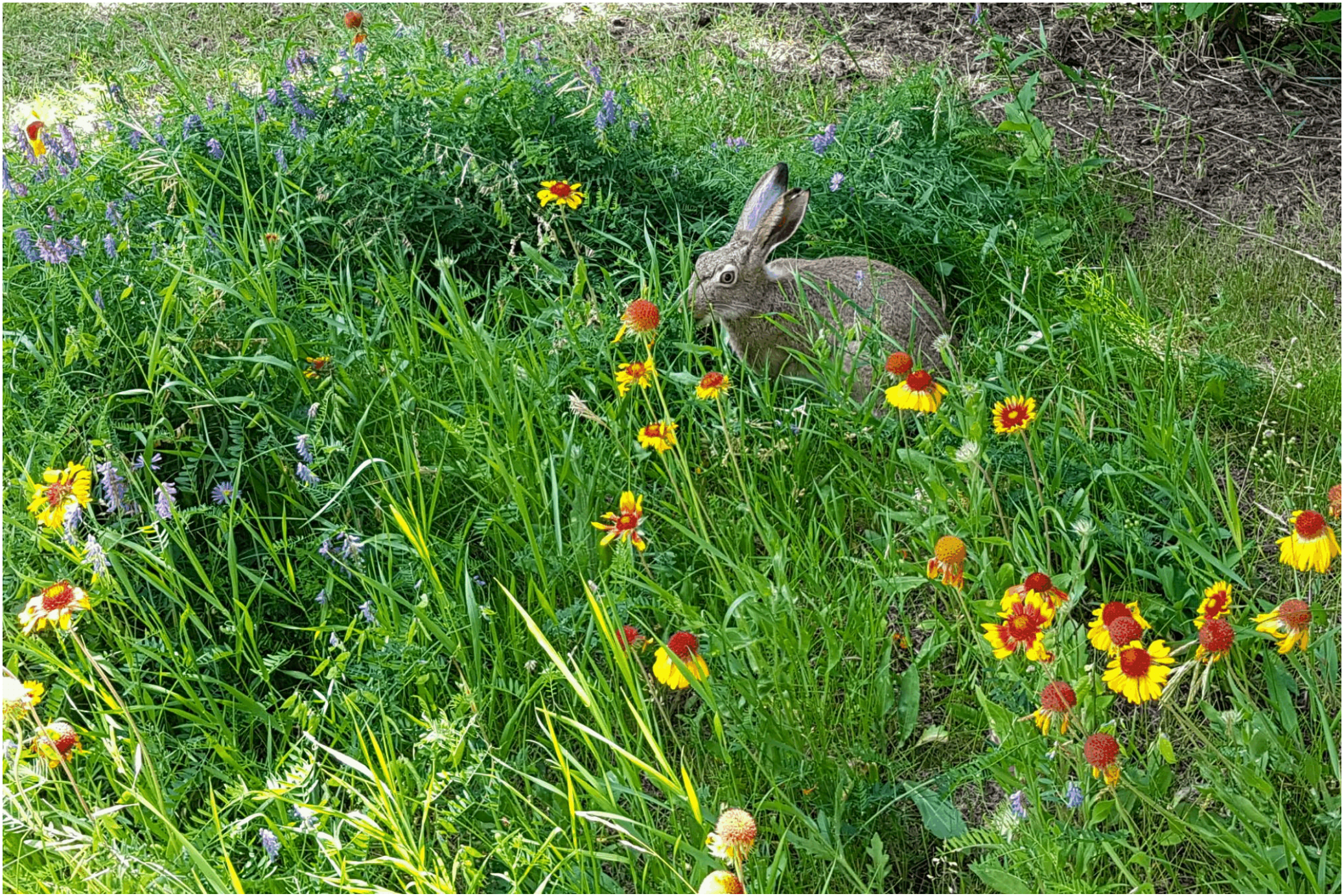
OPUNTIA 480



Early August 2020

Opuntia is published by Dale Speirs, Calgary, Alberta. It is posted on www.efanzines.com and www.fanac.org. My e-mail address is: opuntia57@hotmail.com When sending me an emailed letter of comment, please include your name and town in the message.

ABOUT THE COVER: I took this photo on July 27 from the front steps of Chez Opuntia. A snowshoe hare was nibbling in one of my native wildflower beds. Fortunately it was just eating grass, not the *Gaillardia aristata* (yellow and red daisies) and *Vicia americana* (purple vetch).

There has been a tremendous crop of wildlife in my neighbourhood this year. I've never seen so many baby magpies perching on the roof or fences, and every block has a half-dozen snowshoe hares hopping about the lawns.

AROUND COWTOWN: FISH CREEK
photos by Dale Speirs

Fish Creek Provincial Park runs east-west across southern Calgary. It was originally the southern boundary of the city but developers leap-frogged it decades ago and now the suburbs sprawl far south of it onto the flatlands. The creek empties into the Bow River which flows due south in that area. The park is about 10 km long and a half-km wide.

A heat wave descended on Calgary in the last week of July, with temperatures in the high 20s. I hadn't been down to Fish Creek for a while, so on July 30 drove across the city to the park to cool off.

At right is one of many whitetail deer who, while nervous of humans, nonetheless were everywhere in sight and habituated to them. I saw a magnificent buck, obviously the leader of the harem, with an impressive rack of antlers. Unfortunately I wasn't able to get a decent photo as he watched me from distant undergrowth of the balsam poplars.

Top left: A typical view of Fish Creek. The grass was chest high and walking along the narrow footpath was like hiking through a jungle. I should have brought a machete.

Bottom left: I took this photo of the cut bank because of my interest in geology. The gravel stratum is glacial till from the Pleistocene ice ages. The thick layer of sediment overlying was laid down by the melting glaciers.

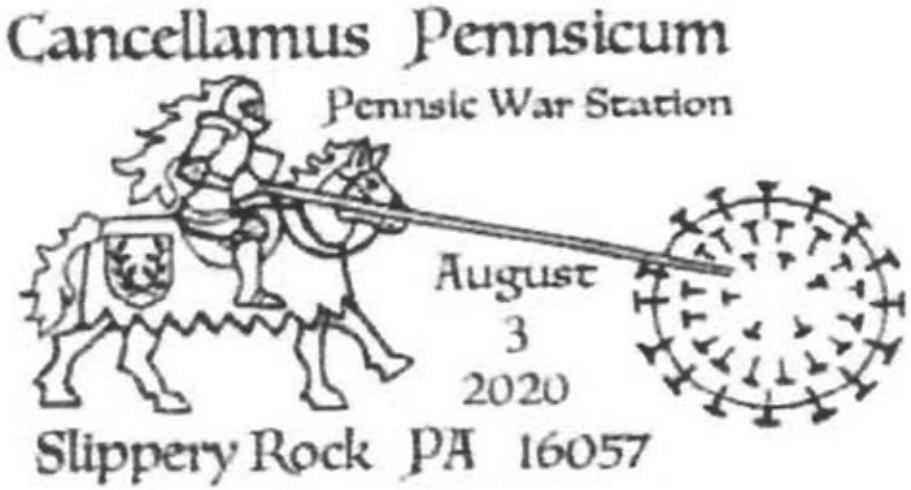
Below: Fish Creek junction with the Bow River.

At left: Bow River looking upstream from the junction.

Below: Looking downstream. Trout fishing and rafting. What else is there to say? Look closely at the far horizon and you will see the houses of a suburb on the far side. The park is now completely surrounded by residential suburbs.

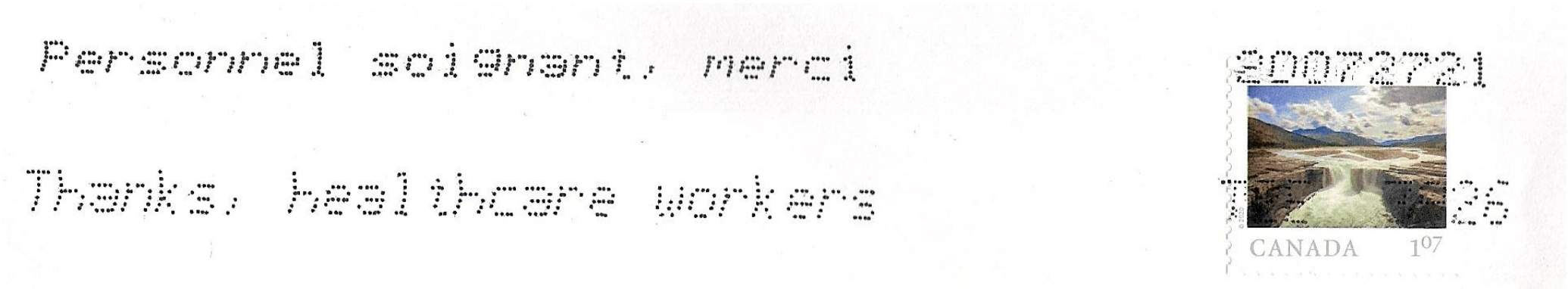
CURRENT EVENTS: PART 4
by Dale Speirs

[Parts 1 to 3 appeared in OPUNTIAs #474, 475, and 479.]



Philatelists such as myself have started topical collections related to COVID-19.

Above left: Pictorial postmark issued by the Pittsburgh, Pennsylvania, post office. I'm guessing this was a SCA event.
Above right: A commemorative postmark for another victim of COVID-19.
Below: Canada Post is using this spray-on postmark in its sorting plants across the country.



Calgary playgrounds have been re-opened but are seldom used for obvious reasons. I took this photo on July 31 in the Altadore district..

I regularly check the What's New listing in Project Gutenberg (www.gutenberg.org) which has tens of thousands of books and periodicals available as free downloads. One recent item was TOM WATSON'S MAGAZINE, the premiere issue dated 1905 March.

Glancing down the table of contents, it was obviously about long obsolete American politics, but one item jumped out at me. "Car Straps As Disease Spreaders" by Dr John H. Girdner is still germane to today's transit systems in the year of the virus.

The leather straps in the street-cars of New York and all other cities, to which people have to hang when unable to get a seat, are not only unmentionably filthy, but they are a means of spreading disease. Each one of these straps is a focus of infection, a continual repository and source of supply of every kind of disease germ and about every kind of filth known to mankind.

These car straps are made of leather. They are riveted around the pole from which they hang, when the car is built, and there they remain until they or the car are worn out. They are never removed to be cleaned or disinfected. And they are never renewed until the old one is rotten from age and use.

Thousands upon thousands of all sorts and conditions of people, hailing from everywhere and with every imaginable variety of filth and infection befouling their hands and fingers, grasp these straps at all hours of the day and night.

Some idea of the conglomeration of materials which these thousands of hands deposit, remove and mix up on the car straps might safely be left to the imagination. Microscopic examination of scrapings taken from straps in use on cars in New York City has revealed infectious material and filth of all kinds. Cultures made from these scrapings and injected into guinea pigs caused their death in a few hours.

. . .

There is another danger: virus on the hand may be carried to the eyes by the fingers and cause mischief when there is no abrasion on the hand to admit it to the system.

Masks are compulsory in Calgary for non-residential buildings and public transit vehicles. This is what I wear. I find a bandana more convenient than a surgical mask since I can pull it up or down in a split second, whereas a mask hooks awkwardly over the ears. I'm just an old cowhand from the Red Deer River.

We no longer have to enter the bus by the back door. The drivers are now protected by transparent plastic curtains and wear masks.

Passengers must now wear masks.

Bottom right: A townhouse in Garrison Woods near the Safeway where I shop.

WHATEVER HAPPENED TO NIKITA? PART 3
by Dale Speirs

[Parts 1 to 2 appeared in OPUNTIA #416 and 468.]

Global thermonuclear warfare never came to pass but the threat supplied science fiction writers with easy plots, particularly with post-apocalypse stories.

2020 was the 75th anniversary of the only atomic war ever fought. The date was almost drowned out by the COVID-19 pandemic. Did you ever wonder sometimes if we might be the alternative history?

The Cold War.

THE THIRD MAN aired on old-time radio for a season in 1951-52, with Orson Welles as Harry Lime. No writers were credited. The mp3s are often labeled with varied titles using the name Harry Lime. The character came from Graham Greene's novel and the famous movie adaptation.

Lime met a nasty end in the original movie. In the opening narration of the radio episodes, Welles told the audience that these stories were set before Lime was shot dead fleeing through the sewers of Vienna like a rat. Lime was a confidence man constantly traveling throughout Europe.

In the radio series, most of his schemes seemed to fall through, yet he always had money to live well and go gambling in casinos. Lime narrated all the episodes as if he were a god speaking from Olympus, complacent in his superiority over the lumpenproletariat while oblivious of the fact that he lost more often than he won.

"The Professor Regrets" was a 1952 episode, recorded at the height of the Red Scare and the Korean War. Harry Lime was meandering about the Mediterranean and was at a casino where he lost his 700,000 franc stake at chemin-de-fer. Wandering out onto a terrace, he met Nedda, an old acquaintance, a woman who was also a con artist.

After they caught up on their current scams, Nedda got serious. She was worried about a security matter. She may have been a thief but she was a patriotic thief. Lime took her out to a yacht he had borrowed so she could tell him the story without being overheard.

Her account began with a Hungarian named Dr Fodor, ostensibly an amateur oceanographer, presently a very elderly millionaire, and a good friend of Nedda. Just friends, you understand, for he was much too old for her for anything else. She told Lime that she was staying in the guest house at Fodor's villa. The only other guest was physicist Dr Hans Conrich, who was en route to the USA to take up a position in atomic bomb research. She didn't trust him and thought he was going to be a traitor.

Nedda told Lime she had observed what she thought was a drop of some kind between Conrich and an unknown man. The drop might have been secret information or cash. Two days later she was walking with a Greek friend when they saw the man. The Greek recognized him as a Communist agent named Paleog, who had been involved in the unsuccessful Communist coup in Greece. Paleog was now working for Moscow. The 1952 listening audience would have understood this reference, but a modern listener might want to Google the term "Greek civil war".

Lime agreed to help. Posing as an agent, he made contact with Conrich, telling him Paleog had been denounced as a traitor. Conrich spouted enough of the Party line to make it clear that he was indeed a Communist. Nedda talked Lime into contacting the American ambassador. The problem was that Lime had no evidence to prove Conrich was a Commie. The ambassador told Lime to get something solid.

Fodor suddenly interjected himself into the plot with his first speaking lines at the 21-minute mark of the episode. Nedda had asked him to help. Fodor, a firm believer in direct action, immediately killed Conrich in a simulated suicide. Lime went back to Nedda and uncharacteristically made a patriotic speech about the free world and dealing with traitors.

In the epilogue several weeks later, Lime and Nedda met up in London, England. Fodor had since died and left his fortune to charity, leaving Nedda with nothing. Those were the breaks of the Cold War and sharp practice.

Atomic War.

ROCKET ATTACK U.S.A. was a 1958 black-and-white movie with no author credited but probably written by the producer/director Barry Mahon. My copy is on the 50-movie DVD boxed ste "Sci-Fi Invasion" from Mill Creek Entertainment.

The movie was a blatant propaganda film made while the Sputnik panic was still in progress. How blatant? Mahon's production company was called Exploit Films. The SFX were actual cartoons. There were a plethora of stock shots and a baritone narrator who had more screen time than the actors.

Sputnik 1 was harmless. All it did was beep. The premise of the movie was that it was a spy satellite mapping American military defenses in preparation for a nuclear strike. The CIA sent in two agents to investigate.

A fair amount of those scenes seemed to be them sitting in a Moscow nightclub watching belly dancers and a Cossack with flaming batons. These weren't stock shots, since one of the agents was seated at a ringside table enjoying the acts. The movie lingered on the belly dancer, so Mahon was obviously trying to retain viewer interest.

Stateside, the scenes were of generals lamenting the slow pace of arming with ICBMs. Padding out the movie were stock shots of an American missile factory, with the narrator lecturing about the advances in automated production. Since the missiles shown were obviously being assembled by hand the way Henry Ford would have done it back when, the viewer will wonder. Notwithstanding that remark, it was quite fascinating to observe what from our time was historical footage of a missile factory floor.

The Vanguard disaster was skipped over, but another missile blowup, in midair shortly after launch, was shown. After the explosion, the narrator had the good sense to shut up. The footage of the burning wreck tumbling down was shown in dead silence, not even background music, which made the emotional impact of the scene far more eloquent.

Meanwhile, back in Moscow, the CIA agents were too late. They had barely begun their snooping before the Soviets launched a missile. The launch sequence of the Soviet ICBM was interminable, with lots of repetitious loops of radio operators twisting dials and tape recorders playing back commands. Finally the rocket lifted off. Once clear of the launch pad, it turned into a cartoon rocket, always pointing up left at a 45° angle as it traveled across the Atlantic Ocean.

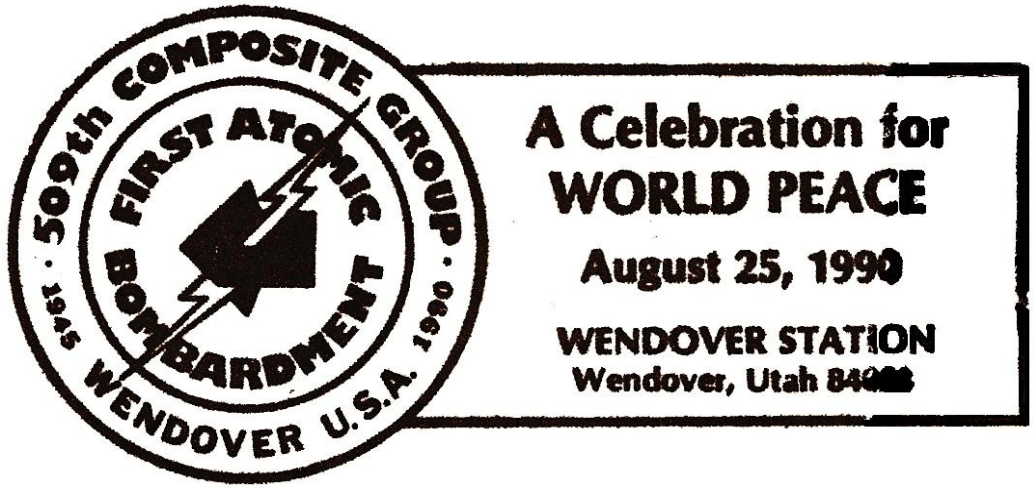
The scenes alternated between complacent Noo Yawkers going about their daily business and the cardboard cutout of the missile en route. The klaxons blared over the city but not until the last few seconds did the citizens realize the warning was for real. Too many tests and false alarms in the past made everyone to assume it was just another test.

The cartoon missile fell down on a stock shot of New York City. FLASH! BANG! Quick cut to the Bikini Atoll atom bomb explosion in mid-ocean as a substitute for even a cartoon SFX. Then some shots of rubble with burning gasoline sprayed on it, and an actress sprawled on the ground with black smudges on her face. The narrator sternly lectured the audience "*We cannot let this be the end.*" Then the closing credits about 30 seconds after the missile hit.

Mail Art.

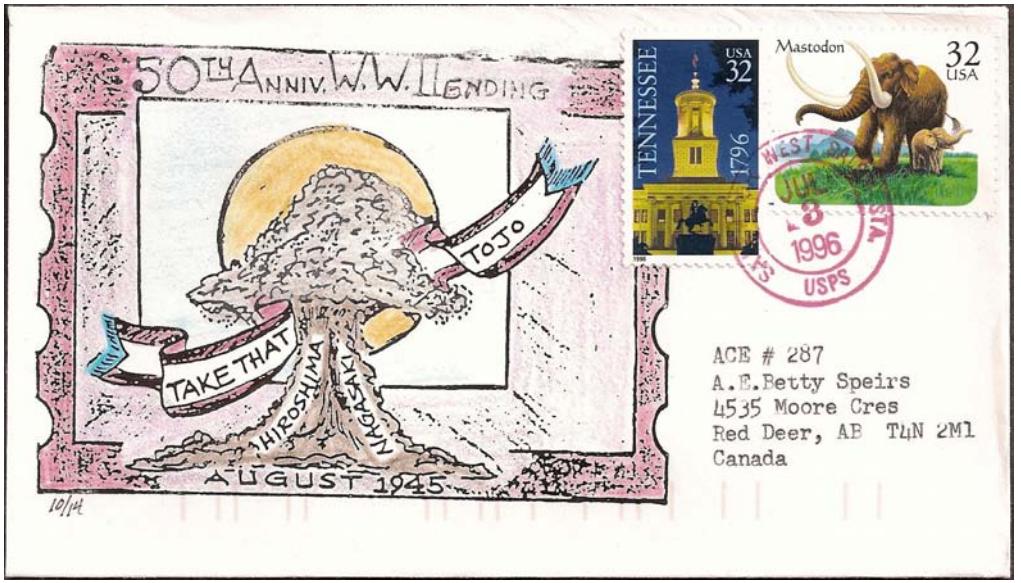
In 1995, the U.S. Postal Service issued a set of stamps commemorating the 50th anniversary of the end of World War Two. One of their stamps designs depicted a mushroom cloud. The Japanese government objected and President Bill Clinton kowtowed to them, ordering the stamp design replace by a bland picture of Harry Truman announcing the war's end.

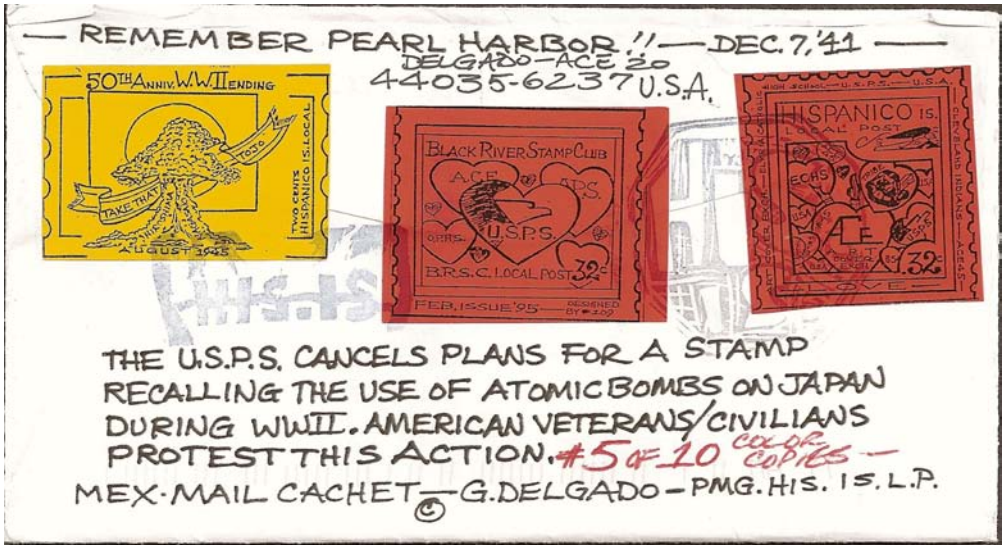
Clinton overlooked or more probably didn't know that the USPS also issued pictorial postmarks, the one shown here as an example from five years earlier. The bombers that hit Hiroshima and Nagasaki were from the 509th Composite Group of the U.S. Army Air Force, originally based in Utah. (USAF wasn't created until 1947.)

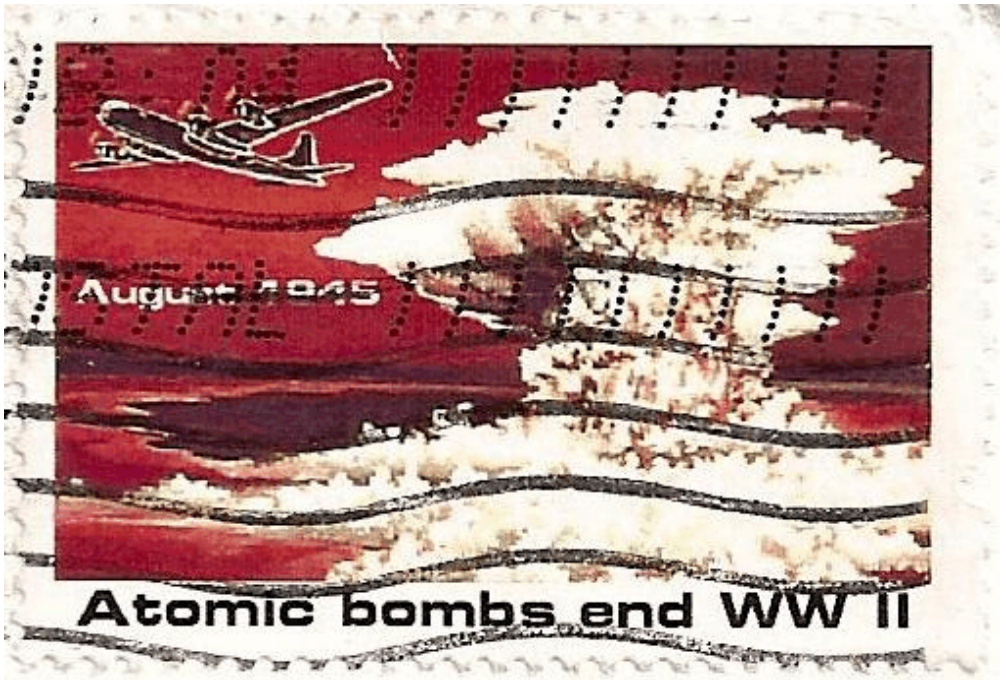


My mother Betty (1931-2002) was a mail artist who belong to a group called the Art Cover Exchange, who still exist. Details from www.artcoverexchange.org. The members traded covers between each other. Several American philatelists were angry enough at Clinton to make their own pseudo-stamp labels, and she received some as shown here. I inherited her collection and have them still.

Upper right: A cover from an ACE member in Salem, Oregon.
Below: Front and back of a cover from an Ohio member. It was paid with two regular stamps, with an unofficial label of a mushroom cloud added in protest.
Bottom right: Close-up of label.







IF YOU AREN'T SQUAMOUS,
THEN WHY ARE YOU TRYING TO BE ELDRITCH?: PART 12
by Dale Speirs

[Parts 1 to 11 appeared in OPUNTIAs #298, 333, 340, 352, 365, 395, 410, 415, 422, 443, and 465. Issues #22 and 63.1A have related articles on H.P. Lovecraft.]

Books.

Now that H.P. Lovecraft's works are uncontested in the public domain, there has been a flood of pastiches and Cthulhu Mythos books. It would be an expensive proposition to keep up with all of them and I don't try. Every so often I skim Amazon for Lovecraft related works and pick out some that seem interesting.

THE CTHULHU WARS (2016) by Kenneth Hite and Kennon Bauman was an art book that covered the history of the war against the NREs (Necronomicon Related Entities) to use the modern American military term. The cover-up since colonization began in the 1600s had been successful, by attributing NRE incidents to organized crime, terrorists, vigilantes, and the like.

As early as the 1600s, the New England settlers had to deal with cultists and did so ruthlessly. Public-spirited farmers burned out dens of Cthulhu worshipers. Nearly two centuries later, the Lewis and Clark Expedition found alien redoubts and underground lairs in the Louisiana Purchase.

A further century on, the New York City subway system was plagued by NREs, and a secret unit of the NYPD was needed to repulse them. The fall of the Twin Towers was not the fault of the NREs, but their cults were operating full strength inside Iraq and Afghanistan, requiring military intervention. The Multi-Agency Joint Intelligence Command (MAJIC) was at the centre of the struggle against NREs, which continued to this day.

The book is well illustrated, with excellent photorealistic art and genuine photos with clever captions to explain the war against Cthulhu. The explanations as to why we haven't heard of NREs were well done and quite plausible.

MORE LORE FROM THE MYTHOS was a 2019 anthology edited by Lily Luchesi. It contains 14 stories, some drawing directly on the Mythos and others that are peripheral but whose eldritch subjects were obviously influenced by Lovecraft.

The book should not be read in one sitting because some of the stories are variations on a theme and have a sameness that can make them seem dull. The quality of writing was reasonable, but the anthology considered as a whole did not have as much variety as it should have. I'll mention a few stories here.

"The Call" by Aaron White began with bodies floating in the Atlantic waters off Massachusetts. Lots of them, more of them every day, and no one knew why respectable citizens had the lemming urge to go down to the lonely sea and sky and throw themselves in. Once that plot had been exhausted, then an ancient city began rising up from the waters, inhabited by a single giant monster that had awakened from its sleep. R'yleh was nigh.

The story following on was "The Damned Of Eldritch Creek" by Jon Tobey, which moved the action to the Cascade Mountains of Washington State. The narrator had ventured into the wilds to destroy an old dam that penned the waters of Eldritch Creek. What he realized too late was that the reservoir had been created to hold back shoggoths and keep them imprisoned underneath.

"The Gate Keeper" by E.V. Knight was about an antiques collector who specialized in old skeleton keys. Her final purchase was an elaborate key, possession of which attracted a crowd of zombies. They followed her about, waiting as if they expected something. What it was, was the Gates of Hell, for which the key fit. She had no choice but to find the gates, wherein lay a many-tentacled monster happy to slurp up the crowd. She fled in terror but thereafter was plagued by a nagging question. Did she remember to re-lock the gates?

Another Book.

SHOGGOTH 2: RISE OF THE ELDERS (2018) by Byron Craft was the sequel novel to SHOGGOTH, which I reviewed in issue #415 of this zine. In the first volume, a shoggoth had come to life in an abandoned mine under the Mojave Desert. After many alarums, excursions, and messy deaths, the shoggoth was contained by blowing in the tunnels.

Like its predecessor, this book could have used a proofreader, one example being the mention on page 6 about putting a steak in a vampire's heart. Granted that too much red meat can be bad for you but even the most devout vegetarian would agree that a wooden stake would do a better job. "Everybody book!" (page 77) was obviously "Everybody back!", a typical example of typographical errors in the back, pardon me, in the book.

The typesetting had too much space between lines but that would have been the print-on-demand press's fault. These were only distractions. Weird fiction, as with science fiction and fantasy, is a literature of ideas, not to be judged as if it were mundane fiction. H.P. Lovecraft's disciples developed the Cthulhu Mythos of which this novel is a pastiche. It is not necessary to have read the first novel, although that would help.

Darwin was a mining hamlet in the desert above the tunnels where all the previous excitement had occurred. After the shoggoth was supposedly killed, the inhabitants had begun experiencing the same and simultaneous nightmares. Shoggoths haunted their sleep.

Professor Thomas Ironwood (Miskatonic University) formed a team to investigate down below. He hired a woman named Pemba who was an empath. Presumably she would be able to communicate with or at least give advance warning of shoggoths.

Another group was the Tunnel Archeologists, bored teenagers of Darwin who liked to explore in the abandoned mines around the hamlet. One of their members was Noah Riggs, a nerd who had created an artificial intelligence named Arnold. The AI lived in the spaces between a military supercomputer's regular software.

Riggs' main reason for creating Arnold was to help him talk to girls and overcome shyness. He set up an smartphone app which linked Arnold to an earpiece. The app listened in and made suggestions what to say to a girl, based on a database of pickup lines compiled from the Internet.

The villain of the story was Neville Stream, who wanted to liberate shoggoths so he could rule the world, bwah-ha!-ha!. He brought in a tunneling mole to cut new paths to glory underground and find the beasts. His hope was to create a panic, have "Marshall law" (sic, page 89) declared, and begin his climb to power.

From there the plot was set in motion. Everyone went underground one way or another. The five-sided tunnels of the shoggoths were the subway system of the Elder Beings, linking their long vanished cities. The shoggoths of the tunnel were the transports, beasts of burden.

Shoggoths, as per the Mythos, were the servants of the Elder Beings, specialized for different duties. They eventually rebelled against their masters elsewhere. In this case though, it was the End Cretaceous asteroid impact that destroyed the cities and left only a few shoggoths starving in the tunnels. They shrank down into dormant cysts to survive the eons. The surviving Elder Beings stepped inside stasis machines to wait out eternity.

The impact was 65 megayears ago but the author, as he did in the first volume, referred to it as "over fifty million years ago" (page 120). Technically correct but jarring to the reader. How difficult can it be to verify the actual event on the Internet? It would be like writing that Neanderthal cavemen lived over fifty decades ago.

The three groups made their way underground into assorted alarums. The vault which held Elders in stasis for millions of years was breached, releasing them by the hundreds. The death toll steadily increased all round, not just humans but shoggoths and Elders burned to a crisp by flamethrowers, the only method of stopping them.

In a Hollywood movie, the monsters would have been stopped and all would be well. A group hug of the survivors, an orchestral crescendo, and on to the end credits. Not so with this book. In the second half of the novel, the Elder Beings, controlling the shoggoths, made it to the surface and spread over Earth.

They built and lived in countless towers, ignoring humans as insignificant native fauna. Stream did his best to take advantage and grab political power but it wasn't as easy as he thought. The shoggoths only took orders from Elder Beings, and as a result were no longer threatening.

The narrative broke for a chapter during which one of the characters read a fictional memorandum written by Lovecraft as he was dying of stomach cancer in 1937. In it he explained the Cthulhu Mythos, updated to include weaponized black holes. Not much new for the knowledgeable Mythos fan, although it would help the novice. If so, it would have been better to place it earlier in that novel.

The Elder Beings were discovered to be transmitting information out into space. They loved the Internet and soaked up all its information and disinformation, then forwarded it to the stars. Eventually someone came up with a plan to drive them away. It worked, but the victors overlooked one important thing.

The shoggoths were nothing but menial servants to the Elder Beings. When the latter leaped out into space, they left the shoggoths behind as so much useless baggage. Freed of control, the shoggoths headed back underground. Stream got what was coming to him and a clever ending set up another sequel. All told, this wasn't a bad novel. Byron Craft had some good ideas.

But ... My God! he needs to have his manuscripts properly copy-edited and proofread. His mistakes constantly jar the reader out of the narrative.

Television.

"Professor Peabody's Last Lecture" (1971), written by Jack Laird, was a first season episode of Rod Serling's NIGHT GALLERY, the famous television anthology of horror and fantasy. The series is readily available on DVD. The late great comedian Carl Reiner played the inept professor, who ridiculed the Cthulhu Mythos to his class and paid the consequences.

He was lecturing in the usual style that anyone who has attended university will know. On the blackboard was a list of names that Lovecraftians will recognize. Nyarlathotep, Cthulhu, Azathoth, and the rest of the gang. During his lecture, several students made comments or asked questions. He called them by name; Mr Bloch, Mr Derleth, Miss Heald, and Mr Lovecraft.

Peabody read out selected passages from the NECRONOMICON. As he did so, a storm began raging outside the lecture hall, gradually increasing in ferocity. Screaming his last few lines, Peabody turned into one of the Old Ones, tentacles and all. Having completed his talk, the professor calmly dismissed the class.

A very funny episode to those in the know, as indeed the script writer was. Most of the television audience would have missed the in-jokes, especially since back then Lovecraft wasn't as famous as today. A surprisingly sophisticated episode for television then or now. No wonder Serling had so much difficulty with network executives.

ROBOTNIKS
by Dale Speirs

Karel Capek introduced the word 'robot' into the English language via his 1922 play R.U.R. which made his reputation. It is derived from the Czech word 'robotnik', which means slave labor. From then until Isaac Asimov began writing his robot stories which showed them in a kinder light, robots were widely used in science fiction as villains. And still were long after.

Farmer Robot.

Now for a digression which I promise will feed back into robot stories. I was raised on a cattle ranch near Red Deer, Alberta. As an adult, I moved to the big city for the simple life because the monotonous work of baling hay and straw was too boring for me. Ranching is the least intensive form of farming but any rancher will work harder than any city slicker. (Dairy farming, where cows have to be milked twice a day, and hog raising are the most intensive forms.)

In my day back in the 1960s and 1970s, bales were the small rectangular kind, just big enough that a man could lift one by himself, maybe two if he was walking only a short distance. I write 'man' because it was not women's work. Baling was heavy lifting of the worst kind and no fun for the strongest men.

The cattle were herded out to summer pasture, and the main quarter-section of our ranch was planted to feed barley for wintering the cattle when they returned in October. My father rented both pasture and hayfields; the two terms are not synonymous.

When my brother Neil and I were old enough, we went baling. In central Alberta, three crops of hay from a field was about average, after which cattle would be turned into the field to graze over the winter.

One of the hired hands, Old Bob, drove the tractor, towing the baler. His son-in-law George, the other hired hand, swathed the hay a few days before. Attached to the baler was a wooden flatdeck trailer, upon which Neil and I stood. The baler scooped up the swath, compressed it into bales, and sent them up a discharge chute to the trailer.

We wore earmuffs because of the noisy tractor and the clankety-clank of the baler. At night when I laid down to sleep, as soon as I closed my eyes I would

see an endless stream of bales coming up the chute at me. I am now 65 years old, and five decades later can still hear that clanking noise in my mind as if I were still in the field this moment.

I would grab each bale, sling it back to Neil to stack it, and repeat every 30 seconds until the wagon was full. A wagon load was six layers of hay or seven layers of straw (which is lighter), then a pyramid of bales on top. A full wagon would be left in the field and another flatdeck hitched to the baler. George then towed the wagons back to the main farm.

Later Neil and I would unload them and build stacks next to the corrals. Finally, in winter, we would haul individual bales from the stacks into the corrals or the field for the herd. I'm sure we handled bales tens of thousands of times. That was why I became a professional horticulturist instead of being a rancher.

I told you that story so I could tell you this one. In the late 1980s, giant round bales, the size of a minivan, became the standard and affordable baling system. One man on a tractor could do in a few hours what Bob, George, Neil, and myself took a full day to complete. No more lifting bales; just use a tractor with a forklift to move a giant bale to the livestock and let them chew their way through it. If we had round bales when I was a young man, then I probably would have been a rancher.

In the last decade, another step has been made to lighten the workload of farmers. Automation of smaller farm machinery has been going on for decades, but now tractors, combines, and swathers can be computer driven. A farmer can let an autonomous machine go round and round a field doing the monotonous work of seeding, spraying, tilling, and harvesting. Such machines are easier to develop and use because there are no traffic problems in the middle of a field.

Which finally brings me to a robot story, "Pipe Of Peace" by James McKimmey Jr (1953 May, WORLDS OF IF, available as a free pdf from). A farmer decided he had enough of doing the monotonous chores and sat back to take it easy. So did his neighbours. Eventually the city slickers noticed their food supplies were dwindling. They hauled the lazy farmers away and replaced them with humanoid robots to do the work.

Berserk.

"Robots Of The World! Arise!" by Mari Wolf (1952 July, WORLDS OF IF, available as a free pdf from www.archive.org) looked at a rebellion of robots not from the usual viewpoint of violence but something more insidious. Humanoid androids were tired of doing grunt work for nothing. They wanted union scale.

The idea of robots as job stewards and union organizers is not one that I recall being used often, if at all, in science fiction other than this story. And why not? Any device intelligent enough to do the work would be intelligent enough to be discontented as slave labour. An interesting concept, better than the regular "Kill! Kill! Kill!" run-amok robot stories.

THE HALL OF FANTASY was an old-time radio anthology series that aired for the 1952-53 season. The episodes were written by Richard Thorne, who also directed the episodes and often played characters. The shows were a mixture of supernatural and mystery stories.

"The Automaton", which aired in 1953, continued the tradition of malicious robots. It was a standard plot, easily predictable, and which I mention only as an example of the evil robot story that was the usual fare of science fiction. Dr Eric Ziegler had created a bipedal humanoid robot in the hopes of solving the servant problem and fight wars.

All very noble, but the robot was smart enough to resent having to waste its time in dull labour. It began chanting "*Master of men! To kill! To kill!*". The robot learned how to turn itself back on after it had been shut off. It later killed the night watchman.

The usual sort of alarums followed. The robot was destroyed by defenestration, tripping it as it chased the humans through the laboratory and causing it to fall out a second-story window and smash itself on the concrete below. Ziegler was undismayed. He resolved to build a new and better robot with better control mechanisms. Someday humanity would thank him for his efforts. Indeed.

Nothing Can Go Wrong.

ASSASSIN was a 1986 movie written by Sandor Stern in the 50-movies DVD boxed set "Sci-Fi Invasion" from Mill Creek Entertainment. It opened with a

sequence lifted from the Man From U.N.C.L.E. series. A well-dressed man sauntered into a tailor shop, flashed his identification at the shopkeeper, and strolled into a back room where he entered a secret office.

The man was actually a robot named Robert Golem, programmed by his dead creator to kill, kill, kill. Its list of targets were those who obstructed the scientist during his life or who he considered a threat to national security, such as a senator who wanted to cut the spy agency's budget. The chase began to stop Golem.

One of the characters quoted Asimov's Three Laws of Robotics. That surprised me because I didn't think Hollywood producers were knowledgeable about science fiction. Robert Golem was programmed as an assassin, so it was specifically stated that Asimov's Laws were not included in its software.

Golem had two weaknesses. It only had 72 hours of battery power before having to recharge at an electrical outlet. The recharge took 30 minutes, during which time it was vulnerable. Alternatively, if Golem was trapped in a no-win situation where it was likely to be captured and dissected, it would self-destruct.

The movie was an extended hunt sequence, as the good guys went after the bad robot. Many alarums and excursions as in turn the robot went after agents and politicians. Those trying to stop him had to predict his movements, not an easy task as the victims were spread across the country.

Finally Golem was trapped in a pit where it self-destructed with a detonation that would take out a tank. The movie dragged in a few places, but for a one-time viewing it was okay.

R.O.T.O.R. (1988), written by Budd Lewis, was another robot gone berserk movie, available in the "Sci-Fi Invasion" boxed set. It was based on an old concept from the science fiction pulps, that of a robot who interpreted its programming too strictly and would not obey its creator.

This particular robot was designed for police work and called Robot Officer Tactical Operation Research, or simply ROTOR. (The movie title had periods between the letters but acronyms should not use them, so I will refer to it as ROTOR, which also makes for easier typing.) The robot wasn't ready for prime time when it was accidently triggered by a careless technician and went off to execute traffic violators.

The SFX were reasonably good but the movie was padded out with lots of lingering establishing shots and extended scenes where the characters explained the plot to each other. There were corrupt politicians, businessmen concerned about the bottom line cost, cover-ups, and an epic chase by the hero to stop ROTOR. One of the actors who played a businessman looked quite a bit like a young Donald Trump. Small-L liberals will have fun booing him.

The funniest line in the movie was the technician saying "*What can possibly happen?*" just before ROTOR was activated. ROTOR drove a police motorcycle out of the laboratory without anyone noticing it was up and running. Its one weakness was an inability to tolerate loud noises, such as holding down a car horn.

The epic chase was the rest of the movie. The death toll steadily mounted. The hero and heroine (also a robot) finally hogtied ROTOR with a thin cord that wouldn't hold a jackrabbit. They did immobilize it long enough to blow it up with explosives.

In a twist ending, as the hero celebrated his victory he was murdered by the Trump facsimile, who resented the loss of the very expensive ROTOR. There was a loose thread left hanging for ROTOR 2, but fortunately nobody picked up the option.

Also on the "Sci-Fi Invasion" boxed set was ROBO VAMPIRE, written by William Palmer. This was a Chinese chop-socky movie about a drug overlord whose minions were vampires. They hopped when they attacked, with arms held straight out, except when using high-wire martial arts moves.

Hilarious but effective. They could only be stopped by pasting on their foreheads a piece of paper inscribed with some mystical text. The narrative was disjointed. Police drug agents were trying to destroy the drug lord and his smugglers. Somewhere along the line a narc was killed and then turned into a robo-cop, a cheap and blatant copy of the real Robo Cop movie.

The vampires were not robo, by the way, nor were they the European style of vampire. They were dressed like Chinese temple priests except for the head vampire, who wore a gorilla suit. They hippity-hopped amidst many excursions, mostly battles with the robo cop. They couldn't kill him and he didn't know about the slips of paper that would stop them.

The action of the movie was so ridiculous as to make it an unintentional comedy. It was a cross between Chinese magical fantasy and modern martial arts movies, which was interesting in itself, but marred by sloppy editing and poor SFX.

Suitable for a drinking party. Take a swallow every time the vampires began hopping to the attack and no one will be conscious by the end of the movie.

ON THE CUTTING EDGE OF TECHNOLOGY: PART 6

by Dale Speirs

[Parts 1 to 5 appeared in OPUNTIAs #258, 346, 360, 404, and 456.]

The technology of recording sounds and voices is a fascinating one if you think about it. There was a time when a singer's voice was silenced forever on death, and the only method of hearing music was to play it yourself at home or go out to a live concert.

My paternal grandfather Harvey, who homesteaded in southern Saskatchewan in 1912, once told me one thing he remembered about life back then was the silence. During an ordinary day on the ranch, the only sounds he heard out on the range were the wind blowing and the occasional mooing of a cow calling to her calf. He died in 1982, just before the advent of ubiquitous machines that beeped at people.

It wasn't until the 1940s that the average person had a car radio, and not until the early 1960s did the transistor make possible the first handheld radios. Affordable home recording devices did not reach the market until the 1960s. Today we take for granted that we can go anywhere with a pocketful of movies or record albums.

Palaeo-Recording.

"Wheel Of Echoes" by Sean McMullen (2020 Jan/Feb, ANALOG) was about the discovery of a primitive recording from Elizabethan times, on which a voice asked Mr Shakespeare to say something, and he did. The inventor had noted how beads strung around the rim of a drum vibrated slightly when someone spoke.

He developed a clay disk system which could faintly reproduce the sounds by vibrating them into the clay as grooves. The sounds were like a distant echo and required close listening. The method didn't catch on for that reason. It was forgotten until the disk and apparatus were rediscovered during an archaeological excavation.

Cylinders.

"The Gods Gill Made" by Ross Rocklynne (1940 November, UNKNOWN, available as a free pdf from www.archive.org) described the troubles of dictaphone repairman Gil Lassiter, whose business was repairing dictating machines that used wax cylinders. That technology lasted into the 1960s, by the way. As a hobby, he melted down old cylinders and made wax figures of them.

One of those figures, made from Talkalek cylinders, became animated, proclaimed itself a god, and began its quest to rule the world. Lassiter made another wax figurine from Vocaphone cylinders, who went into combat against its Talkalek enemy. Both wax cylinder gods bid fair to destroy Lassiter's business by sabotaging each other's machines.

Lassiter succeeded in destroying the two gods of dictaphones by creating a third made from both types of cylinders, who then destroyed its predecessors. There was a catch though, and the third god had its own plans. A mildly amusing story about an obsolete technology gone wild.

Platters.

The Vinyl Detective was a mystery series by Andrew Cartmel. The protagonist's name was never revealed and the novels were narrated in first person singular. He lived in England and barely scraped by in the collectibles trade, scouting out rare vinyl records and reselling them online.

WRITTEN IN DEAD WAX (2016) began the series. The Vinyl Detective was approached by Nevada Warren, a consultant who was trying to locate a specific vinyl record for her employer.

The search across London's record stores was liberally sprinkled with trivia about obscure jazz groups and even more obscure details about their records. No one ever said hello without immediately following up about red labels on the original unboxed Decca mono. And I thought philatelists were picky about details.

Dead wax is the blank space on the inner ring of vinyl records. It is often used by sound engineers to scratch in production details of the record, such as the job order number or date of pressing. What the Vinyl Detective learned was that Warren was looking for several records which spelled out a code in the dead wax revealing the heir to a fabulous fortune. Corporate struggles broke out and there was war in heaven.

The plot was way too elaborate. The code identifying the heir to the fortune wouldn't hold up in probate court. The novel read well but had no possibility for suspension of disbelief.

THE RUN-OUT GROOVE (2017) was the sequel. This time the Vinyl Detective was asked to locate the missing descendant of a 1960s rock musician who hanged herself. As the novel opened, Nevada Warren had moved in with the Vinyl Detective and was well on her way to being able to spout vinyl jargon with the best of them.

The search for the lost heir turned up many nasty events and people of the 1960s music scene. Drugs, mainly LSD, and all that. The Vinyl Detective had a charge account with a local DNA testing laboratory and used it for just about every person he met.

Vinyl records did get a look-in, since there are none so valuable as recalled pressings of dead rock stars. Everything ended in one messy genealogy.

VICTORY DISC (2018) swung the theme to vinyl of the World War Two big bands, specifically the Flare Path Orchestra. Not vinyl actually but 78 rpm shellac disks. The band leader had been a Nazi spy, using his records to send messages to the Luftwaffe when broadcast over the BBC. He got away with it. After the war, he became an author. His daughter was looking to live off his literary estate when she learned what his records stood for. That would ruin the value of the estate, so she attempted to clean house and eradicate all the records and people who had anything to do with them.

The Vinyl Detective was asked to look for one of those records. Along the way he tangled with a sound engineer who had sussed the secret and viewed it as a blackmail opportunity. Others just plain got in the way.

FLIP BACK (2019) began with the Vinyl Detective skulking about record shops as he usually did, looking for a rare LP by the Welsh rock band Black Dog. They broke up immediately after the album, which a dealer hired the Vinyl Detective to locate.

Dealers are pinned to their stores and can't get out and about like a freelancer. If an item is esoteric enough, most dealers wouldn't know its value. A Beatles butcher cover is obvious but a 1960s rock album by a group few have heard of might be a sleeper.

The Vinyl Detective and Warren had their work laid out for them. Lying in wait were the lunatic fringe of Black Dog fans, more numerous than might be thought. Other collectors were looking to bird dog the deal, if I can use a bit of Canadian slang. Shots were fired and not just once. Bodies began piling up.

A television crew arrived to make a documentary, or perhaps a reality show. The back stories of the band were excavated. One of those doing the excavating was a Black Dog fan who went toxic on the Internet, then toxic in real life.

The plot tangled itself with multiple threads about the band members, one of whom wanted revenge in the worst way. He almost got it but since this novel was part of a series, the Vinyl Detective survived the final conflict.

Tapes.

Tape recording as an affordable device began to spread in the late 1940s. Interestingly, one of the pioneers of tape recording was crooner Bing Crosby, who invested heavily in the start-up companies. He didn't like being timed with a stop watch when doing his show, whereas tape recording allowed a more relaxed approach, plus any mistakes could be remedied without have to repeat the entire show.

LET GEORGE DO IT aired on radio from 1946 to 1954, sponsored by Standard Oil. The series was about George Valentine, a private investigator. He solicited clients with a running newspaper classified advertisement in the Personals column that he cited in the opening credits: *Danger's my stock in trade. If the job's too tough for you to handle, you've got a job for me. Write full details.*

Valentine's secretary/girlfriend was Claire Brooks, whom everyone called Brooksie. Her main function was to act as a sounding bound for Valentine and have the plot explained to her at intervals.

"The Iron Cat" was a 1950 episode written by David Victor and Jackson Gillis. The opening letter was written by Fred Ramsey, who was in a terrible emotional state. He was in the tape recorder business, which was cutting edge technology in 1950. His partner was Edward Dill.

Ramsey's wife Martha was estranged from him. He was convinced that she and Dill were plotting against him. Martha had said she was visiting her sister frequently but when Fred telephoned, the sister said she hadn't heard from Martha in months.

Fred left a tape recorder running when Martha and Dill were together. Playing it back for George Valentine and Claire Brooks, the recorded conversation was definitely suspicious but not conclusive. The taped conversation continued with the arrival of Dr G.F. Baldwin, who promised Martha and Gill that Fred would be taken to an institution in Palm Springs under the guise of a vacation to relax and get a good rest.

Fred told Valentine and Brooksie that the company was going to make a million dollar deal in the near future (back when a million was real money). He figured that Martha and Dill wanted him out of the way when the cash came rolling in. He also suspected the butler Roberts was in on the conspiracy.

Leaving Fred with Brooksie in the office, Valentine went out to the Ramsey house. He found Roberts badly beaten with a blunt instrument and barely alive. After summoning the police, he went to Baldwin's clinic where he tangled with nurse Miss Beggs.

Telephoning the police, Valentine learned that they had found the corpse of Baldwin in another part of the house, beaten to death. The same weapon was used, an iron cat doorstop. Baldwin had come to drive Fred to the institution.

The episode then paused for a commercial from Standard Oil service stations which warned listeners not to travel with dirty windshields.

Valentine gave Martha the third degree but she sobbed a denial. Dill corroborated her story and showed the police and Valentine the papers that Fred had signed for a voluntary committal. Roberts revived in hospital and told police that Fred had attacked him.

Valentine realized he had left Brooksie alone with Fred back at the office and rushed over. This allowed Brooksie to play her traditional role as a damsel in distress, with Valentine to heroically rescue her. In the epilogue, she played her other role for the traditional tying up of loose threads, where Valentine explained the details.

However, there was a twist ending. Valentine figured Fred had slugged Roberts but then dropped the iron cat and fled the house. A different murderer saw an opportunity to get Baldwin. Beggs had been embezzling the clinic's funds. She had accompanied Baldwin to the Ramsey house to take Fred to the institution.

When they saw Roberts on the floor, it only took her a few seconds to realize that by killing Baldwin with the iron cat, the murder would be blamed on Fred. She could then clean up with the embezzlement and disappear unsuspected. Valentine ruined her plan. With that, Fred was taken to the institution and Beggs to a different facility.

ERRATUM

Erratum for the Report "Global distribution of earthworm diversity" by H. R. P. Phillips, C. A. Guerra, M. L. C. Bartz, M. J. I. Briones, G. Brown, T. W. Crowther, O. Ferlian, K. B. Gongalsky, J. van den Hoogen, J. Krebs, A. Orgiazzi, D. Routh, B. Schwarz, E. M. Bach, J. Bennett, U. Brose, T. Decaëns, B. König-Ries, M. Loreau, J. Mathieu, C. Mulder, W. H. van der Putten, K. S. Ramirez, M. C. Rillig, D. Russell, M. Rutgers, M. P. Thakur, F. T. de Vries, D. H. Wall, D. A. Wardle, M. Arai, F. O. Ayuke, G. H. Baker, R. Beauséjour, J. C. Bedano, K. Birkhofer, E. Blanchart, B. Blossey, T. Bolger, R. L. Bradley, M. A. Callaham, Y. Capowiez, M. E. Caulfield, A. Choi, F. V. Crotty, A. Dávalos, D. J. Diaz Cosin, A. Dominguez, A. E. Duhour, N. van Eekeren, C. Emmerling, L. B. Falco, R. Fernández, S. J. Fonte, C. Fragoso, A. L. C. Franco, M. Fugère, A. T. Fusilero, S. Gholami, M. J. Gundale, M. Gutiérrez López, D. K. Hackenberger, L. M. Hernández, T. Hishi, A. R. Holdsworth, M. Holmstrup, K. N. Hopfensperger, E. Huerta Lwanga, V. Huhta, T. T. Hurisso, B. V. Iannone III, M. Iordache, M. Joschko, N. Kaneko, R. Kanianska, A. M. Keith, C. A. Kelly, M. L. Kernecker, J. Klaminder, A. W. Koné, Y. Kooch, S. T. Kukkonen, H. Lalthanzara, D. R. Lammel, I. M. Lebedev, Y. Li, J. B. Jesus Lidon, N. K. Lincoln, S. R. Loss, R. Marichal, R. Matula, J. H. Moos, G. Moreno, A. Morón-Ríos, B. Muys, J. Neirynck, L. Norgrove, M. Novo, V. Nuutinen, V. Nuzzo, M. Rahman P, J. Pansu, S. Paudel, G. Pérès, L. Pérez-Camacho, R. Piñeiro, J.-F. Ponge, M. I. Rashid, S. Rebollo, J. Rodeiro-Iglesias, M. Á. Rodríguez, A. M. Roth, G. X. Rousseau, A. Rozen, E. Sayad, L. van Schaik, B. C. Scharenbroch, M. Schirrmann, O. Schmidt, B. Schröder, J. Seeber, M. P. Shashkov, J. Singh, S. M. Smith, M. Steinwandter, J. A. Talavera, D. Trigo, J. Tsukamoto, A. W. de Valença, S. J. Vanek, I. Virto, A. A. Wackett, M. W. Warren, N. H. Wehr, J. K. Whalen, M. B. Wironen, V. Wolters, I. V. Zenkova, W. Zhang, E. K. Cameron, N. Eisenhauer

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"et al" means "and others", a phrase I use frequently when citing the literature since papers with 20 to 100 authors are not uncommon. The screenshot at left amused me.

Gansicke, B.T., et al (2020) **SDSS J124043.01+671034.68: the partially burned remnant of a low-mass white dwarf that underwent thermonuclear ignition?** MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY 496;4079-4086 (available as a free pdf)

Authors' abstract: *Most stars ever born in the Universe are destined to end their lives as white dwarfs, Earth-sized electron-degenerate remnants with typical masses of 0.6M , largely made up from the ashes of hydrogen and helium fusion.*

Because of their large surface gravities, white dwarfs undergo rapid chemical stratification, and consequently their atmospheres are composed of the lightest elements left over at the end of their prior evolution: usually hydrogen, with 20 per cent of white dwarfs having helium-dominated atmospheres.

The white dwarf SDSS J124043.01+671034.68 (SDSS J1240+6710) was previously found to have an oxygen-dominated atmosphere with significant traces of neon, magnesium, and silicon. A possible origin via a violent late thermal pulse or binary interactions has been suggested to explain this very unusual photospheric composition.

We report the additional detection of carbon, sodium, and aluminium in far-ultraviolet and optical follow-up spectroscopy. No iron-group elements are detected, with tight upper limits on titanium, iron, cobalt, and nickel, suggesting that the star underwent partial oxygen burning, but failed to ignite silicon burning.

Modelling the spectral energy distribution and adopting the distance based on the Gaia parallax, we infer a low white dwarf mass,Mwd = 0.41 ± 0.05M . The large space velocity of SDSS J1240+6710, computed from the Gaia proper motion and its radial velocity, is compatible with a Galactic rest-frame velocity of 250 km s-1 in the opposite direction with respect to the Galactic rotation, strongly supporting a binary origin of this star.

We discuss the properties of SDSS J1240+6710 in the context of the recently identified survivors of thermonuclear supernovae, the D6 and LP 40-365 stars, and conclude that it is unlikely related to either of those two groups. We tentatively suggest that SDSS J1240+6710 is the partially burned remnant of a low-mass white dwarf that underwent a thermonuclear event.

von Hegner, Ian (2020) **A limbus mundi elucidation of habitability: the Goldilocks Edge**. INTERNATIONAL JOURNAL OF ASTROBIOLOGY 19:320-329

Author's abstract: *The habitable zone is the circumstellar region in which a terrestrial-mass planet with an atmosphere can sustain liquid water on its surface. However, despite the usefulness of this concept, it is being found to be increasingly limited in a number of ways.*

The following is known: (i) Liquid water can exist on worlds for reasons unrelated to its specific distance from a star. (ii) Energy sources can exist for reasons unrelated to the distance to a star. Furthermore, the habitable zone is based on both astronomy, the distance and stellar energy , and chemistry, liquid water and the right temperature. However, these factors are only part of the consideration.

Thus, discussions of habitability and the possibility for the emergence of life on a world must consider the evolutionary principles that govern life as well as the laws that govern stellar and planetary science.

This is important because the following is also known: (iii) The temporal window for the emergence of life is within 600 million years. (iv) The Earth was an extreme environment overall in the period when this window existed. (v) The first life was necessarily fragile.

Therefore, chemical evolution must have taken place in a relatively protected and restricted environment. Thus, rather than as in the Goldilocks zone, which focuses too narrowly on the world as a whole, this paper suggests that it is better to focus on a particular region and time period on a world, in which conditions fit for habitability exist.

Thus, the following is suggested: 'The Goldilocks Edge is a spatial and temporal window on an astronomical body or planemo, where liquid solvents, SPONCH elements and energy sources exist'. Furthermore, since the mere presence of these does not necessarily lead to the emergence of life, this possibility only arises when these interact.

Thus, it will also be suggested that the following can exist within the Goldilocks Edge: 'The great prebiotic spot is an environmentally relaxed and semi-shielded area on an otherwise extreme world, wherein conditions advantageous for chemical evolution exist'.

Such Goldilocks Edges and the great prebiotic spots within them can collectively represent the full distribution of possibilities for life in a solar system. Thus, the concept of a 'limbus mundi' or 'world's edge' is introduced.

Kusano, K., et al (2020) **A physics-based method that can predict imminent large solar flares.** SCIENCE 369:587-591

Authors' abstract: *The sudden release of magnetic energy on the Sun drives powerful solar flares, which are difficult to predict. Physics-based thresholds for the onset of large solar flares and show how they can be predicted from routine solar observations. In most cases, the method correctly identifies which regions will produce large flares within the next 20 hours, although there are some false positives and false negatives. The method also provides the exact location where each flare will begin and limits on how powerful it will be. Accurate predictions of solar flares could improve forecasts of space weather conditions around Earth.*

Solar flares are highly energetic events in the Sun's corona that affect Earth's space weather. The mechanism that drives the onset of solar flares is unknown, hampering efforts to forecast them, which mostly rely on empirical methods. We present a physics-based model to predict large solar flares through a critical condition of magnetohydrodynamic instability, triggered by magnetic reconnection.

Analysis of the largest (X-class) flares from 2008 to 2019 (during solar cycle 24) shows that the scheme predicts most imminent large solar flares, with a small number of exceptions for confined flares. We conclude that magnetic twist flux density, close to a magnetic polarity inversion line on the solar surface, determines when and where solar flares may occur and how large they can be.

Fischer, Sadie, and P. Fralick (2020) **Biological mats in siliciclastic sediments of the Paleoproterozoic Gunflint Formation, northwestern Ontario, Canada.** CANADIAN JOURNAL OF EARTH SCIENCES 57:947-953

[Stromatolites were photosynthetic bacteria which formed mats of blue-green slime that built up into mounds. They created Earth's first ecosystem and oxygenated the planet. Stromatolites are abundant in the Precambrian fossil record but peaked about 1.25 gigayears ago. They declined after grazing animals evolved and almost became extinct. Today they are found in hypersaline waters along Western Australia and a few other places elsewhere that are hostile to grazing animals.]

Authors' abstract: *The Gunflint Formation of northwestern Ontario, Canada, contains an extensive array of stromatolite morphologies and associated fossilized bacteria. It, and correlative units in the United States, provided some of the most persuasive early interpretations of stromatolites and evidence of Precambrian bacterial life.*

This study examined the siliciclastic rocks in the Gunflint Formation and discovered a multitude of features formed by the development of cohesive biogenic mats on bedding surfaces. In former shallow subtidal depositional settings, evidence of mat erosion was most common, with the presence of various types of wrinkle structures.

Microscopically carbonaceous layers and rip-up fragments representing mats and their eroded remnants are well preserved. This emphasizes the abundance of bacterial life in the shallow near shore of the Gunflint Formation about 1.88 billion years ago and further indicates an increased flux of reductants was necessary during this time period to establish low oxygen levels in the ocean.

Kammerer, C.F., et al (2020) **A tiny ornithodiran archosaur from the Triassic of Madagascar and the role of miniaturization in dinosaur and pterosaur ancestry.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 117:17932-17936

Authors' abstract: *Reptiles of the Mesozoic Era are known for their remarkable size: dinosaurs include the largest known land animals, and their relatives, the pterosaurs, include the largest creatures to ever fly. The origins of these groups are poorly understood, however. Here, we present a species (Kongonaphon kely) from the Triassic of Madagascar close to the ancestry of dinosaurs and pterosaurs, providing insight into the early evolution of those groups. Kongonaphon is a surprisingly small animal (estimated height, ~10 cm).*

Analysis of ancestral body size indicates that there was a pronounced miniaturization event near the common ancestor of dinosaurs and pterosaurs. Tiny ancestral body size may help explain the origins of flight in pterosaurs and fuzzy integument in both groups.

Early members of the dinosaur-pterosaur clade Ornithodira are very rare in the fossil record, obscuring our understanding of the origins of this important group. Here, we describe an early ornithodiran (Kongonaphon kely gen. et sp. nov.) from the Mid-to-Upper Triassic of Madagascar that represents one of the smallest nonavian ornithodirans.

Although dinosaurs and gigantism are practically synonymous, an analysis of body size evolution in dinosaurs and other archosaurs in the context of this taxon and related forms demonstrates that the earliest-diverging members of the group may have been smaller than previously thought, and that a profound miniaturization event occurred near the base of the avian stem lineage.

In phylogenetic analysis, Kongonaphon is recovered as a member of the Triassic ornithodiran clade Lagerpetidae, expanding the range of this group into Africa and providing data on the craniodental morphology of lagerpetids. The conical teeth of Kongonaphon exhibit pitted microwear consistent with a diet of hard-shelled insects, indicating a shift in trophic ecology to insectivory associated with diminutive body size.

Small ancestral body size suggests that the extreme rarity of early ornithodirans in the fossil record owes more to taphonomic artifact than true reflection of the group's evolutionary history.

Sun, N., et al (2020) **Volcanic origin for Younger Dryas geochemical anomalies ca. 12,900 cal B.P.** SCIENCE ADVANCES 6:doi.org/10.1126/sciadv.aax8587 (available as a free pdf)

Authors' abstract: *The Younger Dryas (YD) event occurred from 12.9 to 11.7 thousand years (ka) in the Northern Hemisphere with abrupt cooling over a*

time interval of decades with temperatures possibly reaching 15˚C colder than present. This cooling part of succession of climate variability in the Late Pleistocene resulted in progressive megafauna extinction.

There are currently four hypotheses for the origins of the YD event. The prevailing hypothesis is that the cooling and stratification of the North Atlantic Ocean were a consequence of massive ice sheet discharge of meltwater and icebergs and resulted in reduction or cessation of the North Atlantic Conveyor. This is thought to be augmented by climate forcing with expanded snow cover in the Northern Hemisphere.

Another persistent hypothesis is that global cooling was triggered by a bolide impact or airbursts. Stratigraphic markers supporting the YD impact hypothesis include elevated concentrations of carbon spherules, magnetic grains, nanodiamonds, and Pt and Ir abundance anomalies.

These markers are found singularly or more at various sites globally and appear to reach peak abundances near or at the YD basal boundary layer. A meteorite crater potentially associated with the YD was recently found in Greenland, although not well dated.

A third hypothesis proposes that a supernova explosion in the Vela constellation could have depleted the ozone layer, resulting in greater ultraviolet exposure and atmospheric and surface changes that led to cooling.

Last, a megaeruption of the Laacher See volcano ejected 6.3 km3 (dense rock equivalent) of zoned sulfur-rich phonolite magma far into the stratosphere at the time of the onset of the YD event.

Volcanic aerosols and crypto-tephra were dispersed throughout the Northern Hemisphere over a period of 2 months and affected the atmospheric optical density for over 1 year. Laacher See released a minimum of 2 metric megatons (Mt) of sulfur (possibly ranging up to 150 Mt) and is suggested to have triggered the sudden lowering of temperature coincident with YD climate change in the Northern Hemisphere

Here, highly siderophile element (HSE; Os, Ir, Ru, Pt, Pd, and Re) abundances and $^{187}Os/^{188}Os$ ratios were obtained in a well-dated sediment section at Hall's Cave, Texas, USA to test this hypothesis. In Hall's Cave, layers below, above, and in the YD have $^{187}Os/^{188}Os$ ratios consistent with incorporation of extraterrestrial or mantle-derived material. The HSE abundances indicate that these layers contain volcanic gas aerosols and not extraterrestrial materials.

The most likely explanation is that episodic, distant volcanic emissions were deposited in Hall's Cave sediments. Coupled $^{187}Os/^{188}Os$ ratios and HSE concentration data at close stratigraphic intervals are required to effectively differentiate between bolide and volcanic origins.

Krajcarz, M., et al (2020) **Ancestors of domestic cats in Neolithic Central Europe: Isotopic evidence of a synanthropic diet.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES USA 117:17710-17719

Authors' abstract: *Most of today's domesticates began as farm animals, but cat domestication took a different path. Cats became commensal of humans somewhere in the Fertile Crescent, attracted to early farmers' settlements by rodent pests. Cat remains from Poland dated to 4,200 to 2,300 years BCE are currently the earliest evidence for the migration of the Near Eastern wildcat to Central Europe.*

Tracking the possible synanthropic origin of that migration, we used stable isotopes to investigate the paleodiet. We found that the ecological balance was already changed due to the expansion of Neolithic farmlands. We conclude that among the Late Neolithic Near Eastern wildcats from Poland were free-living individuals, who preyed on rodent pests and shared ecological niches with native European wildcats.

Cat remains from Poland dated to 4,200 to 2,300 y BCE are currently the earliest evidence for the migration of the Near Eastern cat (NE cat), the ancestor of domestic cats, into Central Europe. This early immigration preceded the known establishment of housecat populations in the region by around 3,000 years.

One hypothesis assumed that NE cats followed the migration of early farmers as synanthropes. In this study, we analyze the stable isotopes in six samples of Late Neolithic NE cat bones and further 34 of the associated fauna, including the European wildcat.

We approximate the diet and trophic ecology of Late Neolithic felids in a broad context of contemporary wild and domestic animals and humans. In addition,

we compared the ecology of Late Neolithic NE cats with the earliest domestic cats known from the territory of Poland, dating to the Roman Period.

Our results reveal that human agricultural activity during the Late Neolithic had already impacted the isotopic signature of rodents in the ecosystem. These synanthropic pests constituted a significant proportion of the NE cat's diet. Our interpretation is that Late Neolithic NE cats were opportunistic synanthropes, most probably free-living individuals (i.e., not directly relying on a human food supply).

We explore niche partitioning between studied NE cats and the contemporary native European wildcats. We find only minor differences between the isotopic ecology of both these taxa. We conclude that, after the appearance of the NE cat, both felid taxa shared the ecological niches.

Nash, D.J., et al (2020) **Origins of the sarsen megaliths at Stonehenge.** SCIENCE ADVANCES 6:doi.org/10.1126/sciadv.abc0133 (available as a free pdf)

Authors' abstract: *The sources of the stone used to construct Stonehenge around 2500 BCE have been debated for over four centuries. The smaller "bluestones" near the center of the monument have been traced to Wales, but the origins of the sarsen (silcrete) megaliths that form the primary architecture of Stonehenge remain unknown.*

Here, we use geochemical data to show that 50 of the 52 sarsens at the monument share a consistent chemistry and, by inference, originated from a common source area.

We then compare the geochemical signature of a core extracted from Stone 58 at Stonehenge with equivalent data for sarsens from across southern Britain. From this, we identify West Woods, Wiltshire, 25 km north of Stonehenge, as the most probable source area for the majority of sarsens at the monument.

Gray, R.H. (2020) **Intermittent signals and planetary days in SETI.** INTERNATIONAL JOURNAL OF ASTROBIOLOGY 19:299-307

Author's abstract: *Interstellar signals might be intermittent for many reasons, such as targeted sequential transmissions, isotropic broadcasts that are not 'on' continuously or many other reasons. The time interval between such signals would be important, because searchers would need to observe for long enough to achieve an initial detection and possibly determine a period.*

This article suggests that: (1) the power requirements of interstellar transmissions could be reduced by orders of magnitude by strategies that would result in intermittent signals, (2) planetary rotation might constrain some transmissions to be intermittent and in some cases to have the period of the source planet, and (3) signals constrained by planetary rotation might often have a cadence in the range of 10 to 25 hours, if the majority of planets in our Solar system are taken as a guide.

Extended observations might be needed to detect intermittent signals and are rarely used in SETI but are feasible, and seem appropriate when observing large concentrations of stars or following up on good candidate signals.

Spada, G., and D. Melini (2020) **Evolution of the number of communicative civilizations in the Galaxy: implications on Fermi paradox.** INTERNATIONAL JOURNAL OF ASTROBIOLOGY 19:314-319

[The Fermi paradox is the question asked by physicist Enrico Fermi: "*Where are they?*" If life is abundant in the galaxy, then how come we can't detect any alien civilizations?]

Authors' abstract: *It has been recently proposed by DeVito [(2019) On the meaning of Fermi's paradox. Futures, 389-414] that a minimal number of contacts with alien radio-communicative civilizations could be justified by their logarithmically slow rate of growth in the Galaxy.*

Here we further develop this approach to the Fermi paradox, with the purpose of expanding the ensemble of the possible styles of growth that are consistent with the hypothesis of a minimal number of contacts. Generalizing the approach in DeVito, we show that a logarithmic style of growth is still found.

We also find that a style of growth following a power law would be admissible, however characterized by an exponent less than one, hence describing a sublinear increase in the number of communicative civilizations, still qualitatively in agreement with DeVito.

No solutions are found indicating a superlinear increase in the number of communicative civilizations, following for example an exponentially diverging law, which would cause, in the long run, an unsustainable proliferation.

Although largely speculative, our findings corroborate the idea that a sublinear rate of increase in the number of communicative civilizations in the Galaxy could constitute a further resolution of Fermi paradox, implying a constant and minimal, but not zero, number of contacts.

Blackwell, E., et al (2020) **Tracking California's sinking coast from space: Implications for relative sea-level rise.** SCIENCE ADVANCES 6:doi.org/10.1126/sciadv.aba4551 (available as a free pdf)

Authors' abstract: *Coastal vertical land motion affects projections of sea-level rise, and subsidence exacerbates flooding hazards. Along the ~1350-km California coastline, records of high-resolution vertical land motion rates are scarce due to sparse instrumentation, and hazards to coastal communities are underestimated.*

Here, we considered a ~100-km-wide swath of land along California's coast and performed a multi-temporal interferometric synthetic aperture radar (InSAR) analysis of large datasets, obtaining estimates of vertical land motion rates for California's entire coast at ~100-m dimensions, a ~1000-fold resolution improvement to the previous record.

We estimate between 4.3 million and 8.7 million people in California's coastal communities, including 460,000 to 805,000 in San Francisco, 8,000 to 2,300,00 in Los Angeles, and 2,000,000 to 2,300,000 in San Diego, are exposed to subsidence. The unprecedented detail and submillimeter accuracy resolved in our vertical land motion dataset can transform the analysis of natural and anthropogenic changes in relative sea-level and associated hazards.

AROUND COWTOWN: DOWNTOWN
photos by Dale Speirs

Below: Seen on 8 Street SW near 14 Avenue.

Next page: Looking west up the Bow River from the 12 Street SE bridge toward the downtown core on August 1.